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Child seat for mounting on a vehicle seat

The invention relates to a child seat for mounting on a vehicle seat having a seat surface which is inclined forward and upward in the direction of travel, the child seat having a base part and seat shell arranged on the base part.

Child seats of this type are arranged on the forwardly and upwardly inclined seat surface of a vehicle seat either in the direction of travel and are generally secured on the vehicle seat with the aid of the vehicle's own seat belt system, or the child seats are arranged on the particular vehicle seat in a manner oriented counter to the direction of travel. As a consequence of the forwardly and upwardly inclined seat surface of the vehicle seat, the inclination of the seat shell is too steep when the child seat is arranged in a manner oriented counter to the direction of travel, i.e. the seating comfort for a child in the child seat is restricted.

EP 09 491 3 A2 discloses a child seat which is provided for mounting on a vehicle seat which has a seat surface which is inclined forward and upward in the direction of travel. This known child seat has a base part and a seat shell arranged on the base part. The base part has a level base area. A wedge element which can be pivoted about a pivot axis is provided on the base area of the base part. The pivot axis is provided in a central region of the base area, thus resulting in a front and a rear base area section. These two base area sections enclose an extended angle, i.e. an angle of 180°, with each other.

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DE 696 07 418 T2 discloses a child seat which is provided for mounting on the vehicle seat, the vehicle seat having a seat surface which is inclined forward and upward in the direction of travel. This known child

seat has a seat shell which may be combined with a base part but is not combined at all times. The base part serves there only to raise the sitting or reclining position of the seat shell. The seat shell is designed
5 on the rear side and lower side with ribs. The transition between the ribs on the rear side and the lower side is of rectilinear design and encloses an obtuse angle in each case with them; it serves as a level bearing surface when the child seat is positioned
10 counter to the direction of travel, as figs. 1 to 4 show. However, this bearing surface is relatively small, for which reason U-shaped bars are additionally also required there to support the child seat.

15 US 6 561 582 B1 discloses a child seat which is provided for mounting on a vehicle seat, the vehicle seat having a seat surface which is inclined forward and upward in the direction of travel. This child seat has a seat plate and a backrest, the seat plate being
20 designed with a level base area. A wedge element can be arranged between the level base area of the seat plate and the inclined seat surface of the vehicle seat, the wedge angle of which wedge element can be set as desired in order to space the backrest of the child
25 seat to be positioned counter to the direction of travel at a sufficient distance from the backrest of the vehicle seat. This known wedge element is not connected displaceably to the base part of a child seat but rather can be set in its wedge angle independently
30 as it were from the child seat.

DE 90 13 833 U1 discloses a child seat with a seat shell which has a level base area. A wedge element can be placed between the level base area and the forwardly
35 and upwardly inclined seat surface of a vehicle seat in order to be able to set the inclination of the child seat in relation to the vehicle seat - in the case of an arrangement of the child seat counter to the direction of travel.

The invention is based on the object of providing a child seat of the type mentioned at the beginning which is of simple design and has the same seating comfort in
5 each case not only when arranged in the direction of travel but also when arranged counter to the direction of travel.

According to the invention, this object is achieved in
10 the case of a child seat of the type mentioned at the beginning in that the base part has a base area with a front base area section and with a rear base area section, which base area sections enclose an obtuse angle with each other, and in that a wedge element
15 bears either against the front or the rear base area section, the wedge element and the front and rear base area sections, which are matched to one another, being designed in such a manner that the wedge element and the respective base area section adjoining the wedge
20 element form a common level bearing surface.

The wedge element and the front and rear base area sections, which are matched to one another, are designed in such a manner that the wedge element and
25 the respective base area section adjoining the wedge element form a common level bearing surface.

The wedge element supplements the obtuse angle of the front and of the rear base area sections of the base
30 area of the base part to 180 angular degrees, so that the wedge element and the base area element adjoining it in each case together form a level bearing surface. This level bearing surface results, in an advantageous manner, in an extensive bearing of the child seat on
35 the seat surface of the vehicle seat and therefore in a stable support of the child seat. This is of advantage for reasons relevant to safety.

To arrange the child seat in the direction of travel, the wedge element is provided on the rear base area section. When the child seat is arranged counter to the direction of travel, the wedge element is arranged on
5 the front base area section of the base part. This results, with respect to the vehicle floor, in an inclination of the seat shell which can be of virtually the same magnitude when the child seat is arranged in the direction of travel and when the child seat is
10 arranged counter to the direction of travel. This means that the seating comfort is the same when the child seat is arranged in the direction of travel and when it is arranged counter to the direction of travel.

15 According to the invention, the wedge element can be fastenable to the base part. In the case of a design of this type, the wedge element is a part separated from the base part. The wedge element can therefore be combined with a plurality of child seats.

20 It may be expedient, however, if the wedge element is connected displaceably to the base part. This makes it impossible for the wedge element to be lost. In the case of such a child seat of the last-mentioned type,
25 the wedge element may be displaceable on the base part along a guide. Similarly, it is possible for the wedge element to be fitted to the base part in a manner such that it can pivot about a connecting axis.

30 Irrespective of whether the wedge element is displaceable on the base part along a guide or is pivotable about a connecting axis, the advantage arises that the wedge element can be arranged in a simple manner either on the front base area section or on the
35 rear base area section of the base area of the base part in order to ensure the at least approximately identical, comfortable, flat inclination of the seat shell in the forward orientation and in the rearward

orientation of the child seat with respect to the direction of travel.

5 According to the invention, the wedge element can have at least one hollow space which is accessible from the outside and forms a storage space. This storage space may be used for utensils as are desirable or possibly necessary for children. These utensils may be, for example, diapers or the like. The hollow space can
10 expediently be closed in order to securely and captively accommodate said utensils situated in the hollow space.

15 In the case of the child seat according to the invention, the seat shell can be connected immovably to the base part or can be formed integrally therewith; however, it is also possible for the seat shell to be displaceable to and fro on the base part between different positions. These positions are, for example,
20 at least one sitting position and at least one reclining position.

Further details, features and advantages emerge from the description below of an exemplary embodiment
25 (illustrated diagrammatically in the drawing) of the child seat according to the invention in combination with a vehicle seat (likewise only indicated schematically).

30 In the drawing:

Figure 1 shows, diagrammatically in a side view, a vehicle seat,

35 Figure 2 shows the vehicle seat according to figure 1 in combination with a known child seat which is arranged, oriented in the direction of travel, on the forwardly and

upwardly inclined seat surface of the vehicle seat,

- 5 Figure 3 shows the known child seat according to figure 2 which is arranged on the vehicle seat counter to the direction of travel,
- 10 Figure 4 shows a child seat according to the invention arranged oriented in the direction of travel on the vehicle seat,
- 15 Figure 5 shows the child seat according to the invention from figure 4 arranged oriented counter to the direction of travel on a vehicle seat,
- 20 Figure 6 shows a child seat according to the invention in combination with the associated wedge element which is fastenable to the base part of the child seat,
- 25 Figure 7 shows the child seat according to the invention with the wedge element arranged on the rear base area section of the base area of the base part - similar to figure 4,
- 30 Figure 8 shows the child seat according to the invention with the wedge element arranged on the front base area section of the base area of the base part - similar to figure 5,
- 35 Figure 9 shows a diagrammatic illustration of a child seat according to the invention in combination with a wedge element which can be displaced on the base part along a guide,

Figure 10 shows the child seat according to figure 9,
the wedge element being fixed on the rear
base area section of the base area of the
5 base part,

Figure 11 shows the child seat according to figure 9,
the wedge element being fixed on the front
base area section of the base area of the
10 base part,

Figure 12 shows a different design of the child seat
according to the invention, the wedge
element being fitted to the base part in a
15 manner such that it can pivot about a
connecting axis,

Figure 13 shows the child seat according to figure
12, the wedge element being arranged on the
rear base area section of the base area of
20 the base part - according to figure 4, and

Figure 14 shows the child seat according to figure
12, the wedge element being arranged on the
front base area section of the base area of
25 the base part - according to figure 5.

Figure 1 shows, diagrammatically in a side view, a
vehicle seat 10 with a seat plate 12 and a backrest 14.
30 The seat plate 12 has a seat surface 16 which is
inclined forward and upward in the direction of travel.
The direction of travel is indicated by the arrow 18.

Figure 2 shows the vehicle seat 10 according to figure
35 1, on the seat surface 16 of which a known child seat
20 is arranged and is secured by means of a vehicle's
own three-point seat belt system (not illustrated). The
child seat 20 has a base part 22 and a seat shell 24
arranged on the base part 22. The base part 22 and the

seat shell 24 are designed in such a manner that the child seat 20, which is oriented in the direction of travel, takes up a matching inclination. This inclination is indicated by the thin chain-dotted line 26. As can be seen from figure 3, this inclination 26 is, however, very steep if the child seat 20 is oriented on the vehicle seat 10 counter to the direction of travel 18. This has a correspondingly negative effect on the seating comfort of a child in the child seat 20.

The child seat 28 according to the invention provides a remedy for this in a simple manner, as described below in conjunction with figures 4 to 14.

Figure 4 shows - corresponding to figure 1 - a vehicle seat 10 with a seat surface 16 which is inclined forward and upward in the direction of travel 18, and a child seat 28 according to the invention with a base part 30 on which a seat shell 32 is provided. The seat shell 32 may be fastened fixedly to the base part 30. The seat shell 32 may, however, also be fitted to the base part in a manner such that it can be displaced to and fro between different positions.

The base part 30 has a base area with a front base area section 34 and with a rear base area section 36. The front and the rear base area sections 34 and 36 enclose an obtuse angle 38 with each other.

The child seat 28 according to the invention is combined with a wedge element 40 which is arranged either on the front or on the rear base area section 34 or 36 in such a manner that the wedge element 40 and the respective base area section 34 or 36 adjoining the wedge element 40 form a common level bearing surface 42 (see, for example, figures 7, 8; 10, 11; 13, 14). This results in a stable support of the child seat 28 on the seat surface 16 of the vehicle seat 10. The securing of

the child seat 28 on the vehicle seat 10 takes place with the aid of a vehicle's own three-point seat belt system (not illustrated). A child is also secured in the child seat 28 at the same time with the aid of the
5 three-point seat belt system.

In figure 4, the wedge element 40 is provided on the rear base area section 36 and the child seat 28 is oriented forward in the direction of travel 18. By
10 contrast, in figure 5, the wedge element 40 is provided on the front base area section 34 and the child seat 28 is oriented counter to the direction of travel 18. The inclination of the child seat 28 with respect to the floor of the vehicle, which inclination is indicated by
15 the chain-dotted line 26, is of at least approximately the same magnitude when the child seat 28 is arranged in the direction of travel 18 and when it is arranged counter to the direction of travel 18, as is readily revealed by a comparison of figures 4 and 5.

20 Figure 6 diagrammatically illustrates the design variant, in which the wedge element 40 is fastenable to the child seat 28. This fastenability is indicated by the arrow 44.

25 Figure 7 illustrates the wedge 40 fastened to the rear base area section 36 and figure 8 illustrates the wedge 40 fastened to the front base area section 34.

30 In comparison to the design according to figure 6 with the wedge element 40 fastenable to the base part 30 of the child seat 28, figure 9 illustrates a design of the child seat 28 according to the invention with a wedge element 40 which can be displaced on the base part 30
35 of the child seat 28 along a guide. This is indicated by the curved arrow 46. Figure 10 illustrates the child seat 28 according to figure 9, the wedge element 40 being provided and fixed on the rear base area section 36. By contrast, figure 11 illustrates the child seat

28 according to figure 9, the wedge element 40 being provided and fixed on the front base area section 34 of the base part 30 of the child seat 28.

5 Figure 10 diagrammatically illustrates a design of the child seat 28 according to the invention, with the wedge element 40 being fitted to the base part 30 of the child seat 28 in a manner such that it can pivot about a connecting axis 48. This pivotability is
10 illustrated by the curved arrow 50.

Figure 13 illustrates the child seat 28 according to figure 12, with the wedge element 40 being pivoted about the connecting axis 48 to the rear base area
15 section 36 and bearing against the latter. Figure 14 illustrates the child seat 28 according to figure 12, with the wedge element 40 being pivoted about the connecting axis 48 to the front base area section 34 and bearing against the latter.

20 The wedge element 40 can be designed with at least one hollow space 52 which is accessible from the outside and forms a storage space. A hollow space 52 of this type is indicated diagrammatically in figure 14.

25 The same details are denoted in each case by the same reference numbers in figures 1 to 14, and so it is unnecessary to describe all of the details in detail in each case in conjunction with all of the figures.